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SHORT COMMUNICATION

Two newly recorded species of the genus *Hypsibius* (Tardigrada; Hypsibiidae) from China

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Abstract: This paper reported two newly recorded species, *Hypsibius convergens* Urbanowicz, 1925 and *Hypsibius hypostomus* Bartoš, 1935, of the genus *Hypsibius* (Tardigrada; Hypsibiidae) from China. Both species were collected from Taibai Mt, Shaanxi Province. All specimens are deposited at the College of Life Sciences, Shaanxi Normal University, China.

Key words: Tardigrada; *Hypsibius*; taxonomy; new record; China

Introduction

Over 35 species of the genus *Hypsibius* have been described in the world (Guidetti & Bertolandi 2005). However, only 5 species of this genus were reported from China (Li et al. 2007). In this paper, two newly recorded species, *Hypsibius convergens* Urbanowicz, 1925 and *Hypsibius hypostomus* Bartoš, 1935 were reported.

Materials and methods

Tardigrades were extracted from mosses and lichens collected from Taibai Mt. which is located in the central part of Shaanxi Province, China. All specimens were mounted in Hoyer's medium on microscope slides and the coverslips were sealed with epoxy paint for identification. Observation and measurements were made using phase contrast microscopy (PCM) (Leica DM LB2) and an eyepiece micrometer. Photomicrographs were made using PCM associated with a digital camera (Leica DFC Twain 6.1.1). All measurements were given in micrometers (μm). Structures were measured only if their orientation was suitable. Body length was measured from the anterior end to the end of the body, not including the hind legs. Buccal tube length and the level of the stylet support insertion point were measured according to Pilato (1981). Buccal tube widths were measured as the external diameters at the level of the stylet support insertion point. Lengths of the claw branches were measured from the base of the claw to the top of the branch, including accessory points. *pt* is the percent ratio between the length of a structure and the length of buccal tube measured from the medio-dorsal transversal ridge to the base of the pharyngeal apophyses (Pilato 1981). The specimens are deposited at the College of Life Sciences, Shaanxi Normal University, China.

Taxonomic accounts

Class Eutardigrada Marcus, 1927
Order Parachela Schuster, Nelson, Grigarick, & Christenberry, 1980
Family Hypsibiidae Pilato, 1969
Genus *Hypsibius* Ehrenberg, 1848
Hypsibius convergens Urbanowicz, 1925
(Figures 1–2, Table 1)

Material examined: 15 specimens were collected from Taibai Mt. (34º46'N, 108º02'E) at 2,200 m above the sea level.

Description: Length up to 280 μm (Table 1), cuticle smooth, eye spots present. Buccal tube rather narrow, from 1.5 to 2 μm in diameter, with appendices of insertion for the muscles in the form of a hook. Pharynx rather elongated oval, containing apophyses and two macroplacoids, of which the first longer than the second; the second oval granule-shaped. Microplacoid sometimes present, when present, very small. Septula absent (Fig. 1).

Double claws on all legs very different in size. The basal branch inserted very low on the secondary branch. Each primary branch with two accessory points, a sclerotized bar present between anterior claw and posterior claw on hind legs (Fig. 2).

Remarks: *H. convergens* has been collected from a variety of localities, such as Europe, North and South America, Fernando

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Poo Island, Kerguelen Island, India, Turkey, British Columbia, Canada, and the Arctic (Ramazzotti & Maucci, 1983; Kathman, 1990). It is the first report of this species from China.

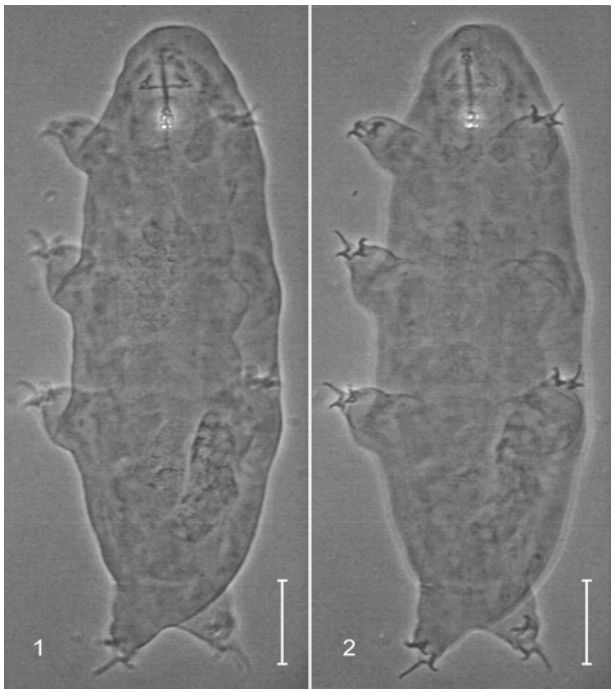
Table 1 Measurements of *Hypsibius convergens* *

Character	LMI		SMI		Mean ± SD (n = 15)	
	μm	*pt*	μm	*pt*	μm	*pt*
Body length	275		166		214.5±13.88	
Buccal tube length	28.19		20.36		24.44±1.1	
Stylet support insertion point	15.92	56.48	11.22	55.13	13.80±0.63	56.32±0.76
Buccal tube width	1.57	5.56	1.04	5.13	1.14±0.07	4.49±0.17
1st macroplacoid length	3.13	11.11	3.13	15.38	3.20±0.10	13.95±0.24
2nd macroplacoid length	2.09	7.41	2.09	10.26	2.15±0.07	9.34±0.15
Placoid row length	6.26	22.22	6.26	30.77	6.39±0.16	27.78±0.49
Leg 1 external claw primary branch length	11.75	41.67	9.14	44.87	10.54±0.45	43.56±0.51
Leg 1 external claw secondary branch length	6.79	24.07	4.96	24.36	5.81±0.26	23.81±0.31
Leg 1 internal claw primary branch length	8.35	29.63	6.26	30.77	7.31±0.32	30.32±0.39
Leg 1 internal claw secondary branch length	4.96	17.59	4.18	20.51	4.67±0.17	19.81±0.52
Leg 2 external claw primary branch length	13.57	48.15	9.66	47.44	12.14±0.68	49.99±1.25
Leg 2 external claw secondary branch length	7.31	25.93	5.48	26.92	6.48±0.31	26.62±0.45
Leg 2 internal claw primary branch length	8.61	30.56	6.79	33.33	7.86±0.33	32.69±0.37
Leg 2 internal claw primary branch length	5.48	19.44	4.44	21.79	5.06±0.19	21.18±0.39
Leg 3 external claw primary branch length	15.14	53.70	10.70	52.56	13.49±0.76	55.37±1.21
Leg 3 external claw secondary branch length	8.09	28.70	6.26	30.77	7.18±0.32	29.52±0.46
Leg 3 internal claw primary branch length	9.14	32.41	7.31	35.90	8.38±0.34	34.81±0.49
Leg 3 internal claw secondary branch length	5.74	20.37	4.96	24.36	5.48±0.17	23.04±0.45
External claw 4 primary branch length	18.80	66.67	13.57	66.67	15.99±0.89	64.40±1.29
External claw 4 secondary branch length	8.87	31.48	7.05	34.62	7.90±0.31	32.51±0.59
Internal claw 4 primary branch length	10.70	37.96	8.09	39.74	9.20±0.36	37.92±0.52
Internal claw 4 secondary branch length	6.79	24.07	5.74	28.21	6.20±0.21	25.84±0.56

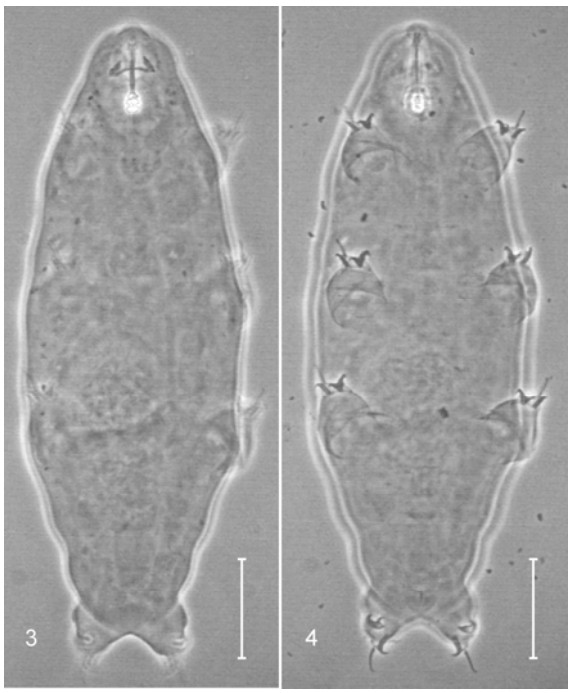
*LMI, the largest measured individual, SMI, the smallest measured individual; SD = standard deviation.

Table 2 Measurements of *Hypsibius hypostomus*

Character	Specimen 1		Specimen 2		Specimen 3	
	μm	*pt*	μm	*pt*	μm	*pt*
Body length	238		292		312	
Buccal tube length	28.19		31.06		32.1	
Stylet support insertion point	16.18	57.41	17.75	57.14	18.53	57.72
Buccal tube width	1.31	4.63	1.57	5.04	1.57	4.88
1st macroplacoid length	3.13	11.11	3.65	11.76	3.92	12.20
2nd macroplacoid length	2.61	9.26	2.87	9.24	3.13	9.76
Placoid row length	6.79	24.07	7.31	23.53	7.83	24.39
Leg 1 external claw primary branch length	13.57	48.15	14.09	45.38	14.62	45.53
Leg 1 external claw secondary branch length	8.09	28.70	8.35	26.89	8.87	27.64
Leg 1 internal claw primary branch length	8.35	29.63	8.87	28.57	9.14	28.46
Leg 1 internal claw secondary branch length	6.79	24.07	7.31	23.53	7.57	23.58
Leg 2 external claw primary branch length	15.14	53.70	15.92	51.26	16.18	50.41
Leg 2 external claw secondary branch length	8.61	30.56	8.87	28.57	9.14	28.46
Leg 2 internal claw primary branch length	9.40	33.33	9.92	31.93	10.70	33.33
Leg 2 internal claw primary branch length	7.31	25.93	7.83	25.21	8.09	25.20
Leg 3 external claw primary branch length	15.92	56.48	16.70	53.78	17.23	53.66
Leg 3 external claw secondary branch length	9.14	32.41	9.40	30.25	9.92	30.89
Leg 3 internal claw primary branch length	9.92	35.19	10.70	34.45	11.22	34.96
Leg 3 internal claw secondary branch length	7.83	27.78	8.09	26.05	8.35	26.02
External claw 4 primary branch length	19.31	68.52	20.10	64.71	20.36	63.41
External claw 4 secondary branch length	10.18	36.11	10.70	34.45	10.96	34.15
Internal claw 4 primary branch length	10.96	38.89	11.48	36.97	12.01	37.40
Internal claw 4 secondary branch length	8.35	29.63	8.61	27.73	9.14	28.46



Figs. 1-2 ***Hypsibius convergens*** **Urbanowicz, 1925;** 1. Habitus focused to show the bucco-pharyngeal apparatus; 2. Habitus focused to show the double claws. 1-2. Scale bars =40μm



Figs. 3-4 ***Hypsibius hypostomus*** **Bartoš, 1935;** 3. Habitus focused to show the bucco-pharyngeal apparatus; 4. Habitus focused to show the double claws. 3-4. Scale bars = 40μm.

Hypsibius hypostomus Bartoš, 1935
(Figs. 3–4, Table 2)

Material examined: Three specimens were collected from Taibai Mt. (34º18'N, 107º55'E) at 2,800 m above the sea level.

Description: Length up to 310 μm (Table 2), eye spots present, cuticle smooth, color reddish-brown. Buccal aperture turned ventrally. Bucal tube rather narrow (from 1.3 to 1.6 μm in diameter), Pharynx oval, containing robust apophyses and two macroplacoids in the form of granule, of which the first a little larger than the second. Microplaciod and septula absent (Fig. 3).

External and internal claws very different in size; secondary branch short and very curved, principal branch long, slightly curved, with two accessory points. Lunules and cuticular bars absent on all legs (Fig. 4).

Remarks: This species is very similar to *H. convergens*, but differs from it mainly by two macroplacoids in the shape of round granule instead of rod-shaped and by lacking microplacoid. The type locality of this species is in the Tatra peaks (Ramazzotti & Maucci 1983). It is the first report of this species from China.

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